RETURN TO MAIN MENU

POWER MIG™ 215

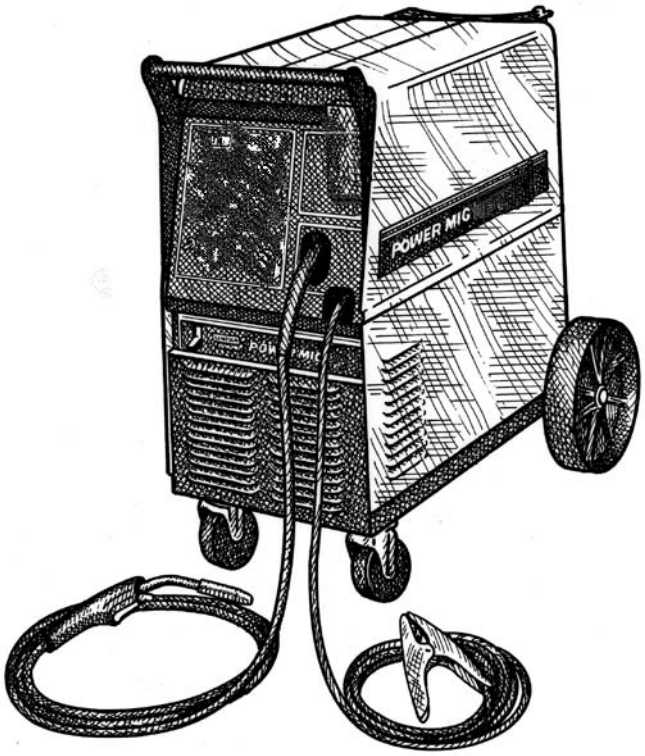
IM828-A

February, 2006

For use with machine Code Numbers **11070, 11099, 11247**

Safety Depends on You

Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation ... and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** And, most importantly, think before you act and be careful.



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OPERATOR'S MANUAL

ISO 9001

Designed and Manufactured Under a Quality Program Certified by ABS Quality Evaluations, Inc. to ISO 9001 Requirements.
CERTIFICATE NUMBER: 30273

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LINCOLN® ELECTRIC

• World's Leader in Welding and Cutting Products •
• Sales and Service through Subsidiaries and Distributors Worldwide •
Cleveland, Ohio 44117-1199 U.S.A. TEL: 216.481.8100 FAX: 216.486.1751 WEB SITE: www.lincolnelectric.com

⚠ WARNING

⚠ CALIFORNIA PROPOSITION 65 WARNINGS ⚠

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

The Above For Diesel Engines

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

The Above For Gasoline Engines

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of "Safety in Welding & Cutting - ANSI Standard Z49.1" from the American Welding Society, P.O. Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974. A Free copy of "Arc Welding Safety" booklet E205 is available from the Lincoln Electric Company, 22801 St. Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE powered equipment.

1.a. Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

1.b. Operate engines in open, well-ventilated areas or vent the engine exhaust fumes outdoors.

1.c. Do not add the fuel near an open flame welding arc or when the engine is running. Stop the engine and allow it to cool before refueling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

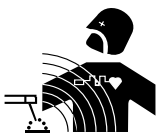
1.d. Keep all equipment safety guards, covers and devices in position and in good repair.Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting gasoline engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.



ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localized Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines

2.b. EMF fields may interfere with some pacemakers, and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimize exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together - Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workpiece as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

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ELECTRIC SHOCK can kill.

3.a. The electrode and work (or ground) circuits are electrically “hot” when the welder is on. Do not touch these “hot” parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- **Semiautomatic DC Constant Voltage (Wire) Welder.**
- **DC Manual (Stick) Welder.**
- **AC Welder with Reduced Voltage Control.**

3.c. In semiautomatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semiautomatic welding gun are also electrically “hot”.

3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

3.e. Ground the work or metal to be welded to a good electrical (earth) ground.

3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

3.g. Never dip the electrode in water for cooling.

3.h. Never simultaneously touch electrically “hot” parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

3.j. Also see Items 6.c. and 8.

ARC RAYS can burn.

4.a. Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87. I standards.

4.b. Use suitable clothing made from durable flame-resistant material to protect your skin and that of your helpers from the arc rays.

4.c. Protect other nearby personnel with suitable, non-flammable screening and/or warn them not to watch the arc nor expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES can be dangerous.

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases.When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit Values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**

5.b. Do not weld in locations near chlorinated hydrocarbon vapors coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapors to form phosgene, a highly toxic gas, and other irritating products.

5.c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to insure breathing air is safe.

5.d. Read and understand the manufacturer’s instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer’s safety practices. MSDS forms are available from your welding distributor or from the manufacturer.

5.e. Also see item 1.b.

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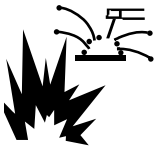


WELDING SPARKS can cause fire or explosion.

6.a. Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to “Safety in Welding and Cutting” (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

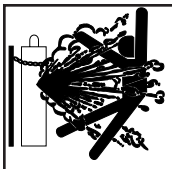
6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapors from substances inside. They can cause an explosion even though they have been “cleaned”. For information, purchase “Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping That Have Held Hazardous Substances”, AWS F4.1 from the American Welding Society (see address above).

6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as practical. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see item 1.c.



CYLINDER may explode if damaged.

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

7.b. Always keep cylinders in an upright position securely chained to an undercarriage or fixed support.

7.c. Cylinders should be located:

- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks, or flame.

7.d. Never allow the electrode, electrode holder or any other electrically “hot” parts to touch a cylinder.

7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7.f. Valve protection caps should always be in place and hand tight except when the cylinder is in use or connected for use.

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-l, “Precautions for Safe Handling of Compressed Gases in Cylinders,” available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.

FOR ELECTRICALLY powered equipment.

8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

8.b. Install equipment in accordance with the U.S. National Electrical Code, all local codes and the manufacturer’s recommendations.

8.c. Ground the equipment in accordance with the U.S. National Electrical Code and the manufacturer’s recommendations.

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PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté specifiques qui parraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

   a. Les circuits à l'électrode et à la piéce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vétements mouillés. Porter des gants secs et sans trous pour isoler les mains.
   b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique ou des grilles metalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
   c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état defonctionnement.
   d.Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
   e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
   f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces precautions pour le porte-électrode s'applicuent aussi au pistolet de soudage.

2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas ou on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.

3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:

   a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
   b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
   c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.

4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans lateraux dans les zones où l'on pique le laitier.

6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.

7. Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidental peut provoquer un échauffement et un risque d'incendie.

8. S'assurer que la masse est connectée le plus prés possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.

9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particuliérement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.

10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgéne (gas fortement toxique) ou autres produits irritants.

11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece à souder doit être branché à une bonne mise à la terre.

2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.

3. Avant de faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite de fusibles.

4. Garder tous les couvercles et dispositifs de sûreté à leur place.

Mar. '93

Thank You —— for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product ••• as much pride as we have in bringing this product to you!

Please Examine Carton and Equipment For Damage Immediately

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, Claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Product _____

Model Number _____

Code Number or Date Code_____

Serial Number_____

Date Purchased_____

Where Purchased_____

Whenever you request replacement parts or information on this equipment, always supply the information you have recorded above. The code number is especially important when identifying the correct replacement parts.

On-Line Product Registration

- Register your machine with Lincoln Electric either via fax or over the Internet.

• For faxing: Complete the form on the back of the warranty statement included in the literature packet accompanying this machine and fax the form per the instructions printed on it.

• For On-Line Registration: Go to our **WEB SITE at www.lincolnelectric.com.** Choose "Quick Links" and then "Product Registration". Please complete the form and submit your registration.

Read this Operators Manual completely before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the safety instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

⚠ WARNING

This statement appears where the information **must** be followed **exactly** to avoid **serious personal injury** or **loss of life**.

⚠ CAUTION

This statement appears where the information **must** be followed to avoid **minor personal injury** or **damage to this equipment**.

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TECHNICAL SPECIFICATIONS – POWER MIG 215

INPUT – SINGLE PHASE ONLY		
Standard Voltage/Phase/Frequency	**Input Current @ 170 Amp Rated Output (With 115V receptacle loaded to 15A)**	**Input Current @ 215 Amp Rated Output (With 115V receptacle loaded to 15A)**
208/230/1/50/60 Hz	39/35 Amps	45/41 Amps

RATED OUTPUT		
Duty Cycle	**Amps**	**Volts at Rated Amperes**
30%	215 Amps	22 Volts
40%	190 Amps	23 Volts
60%	170 Amps	24 Volts

OUTPUT		
Welding Current Range	**Maximum Open Circuit Voltage**	**Welding Voltage Range**
30 – 250Amps	35 Volts	13.5-24 Volts

RECOMMENDED INPUT WIRE AND FUSE SIZES				
Input Voltage/ Frequency (Hz)	**Fuse or Breaker Size (Super Lag)**	**Input Ampere Rating On Nameplate**	**75°C Copper Wire in Conduit AWG (IEC) Sizes (For lengths up to 100 ft.)**	**75°C Copper Wire in Conduit AWG (IEC) Sizes (For lengths exceeding 100 ft.)**
208/50/60	60	45A	10 (6 mm^2)	8 (10 mm^2)
230/50/60	60	41A	10 (6 mm^2)	8 (10 mm^2)
NOTE: Use #10 AWG Grounding Wire				

WIRE SPEED RANGE	
Wire Speed	50 – 700 IPM (1.27 – 17.8 m/minute)

PHYSICAL DIMENSIONS			
Height	**Width**	**Depth**	**Weight**
31.79 in	18.88 in	38.78 in	210 lbs
808 mm	480 mm	985 mm	95 kg

TEMPERATURE RANGES	
OPERATING TEMPERATURE RANGE	**STORAGE TEMPERATURE RANGE**
-4°F to 104°F(-20°C to +40°C)	-40°F to 185°F(-40°C to +40°C)

Read entire installation section before starting installation.

SAFETY PRECAUTIONS

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Only qualified personnel should perform this installation.**
- **Only personnel that have read and understood the POWER MIG 215 Operating Manual should install and operate this equipment.**
- **Machine must be grounded per any national, local or other applicable electrical codes.**
- **The POWER MIG power switch is to be in the OFF position when installing work cable and gun and when connecting other equipment.**

UNCRATING THE POWER MIG 215

Cut banding and lift off cardboard carton. Cut banding holding the machine to the skid. Remove foam and corrugated packing material. Untape accessories from Gas Bottle Platform. Unscrew the two wood screws (at the Gas Bottle Platform) holding the machine to the skid. Roll the machine off the skid assembly.

LOCATION

Locate the welder in a dry location where there is free circulation of clean air into the louvers in the back and out the front. A location that minimizes the amount of smoke and dirt drawn into the rear louvers reduces the chance of dirt accumulation that can block air passages and cause overheating.

INPUT POWER, GROUNDING AND CONNECTION DIAGRAMS

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring.**
- **All input power must be electrically disconnected before proceeding.**

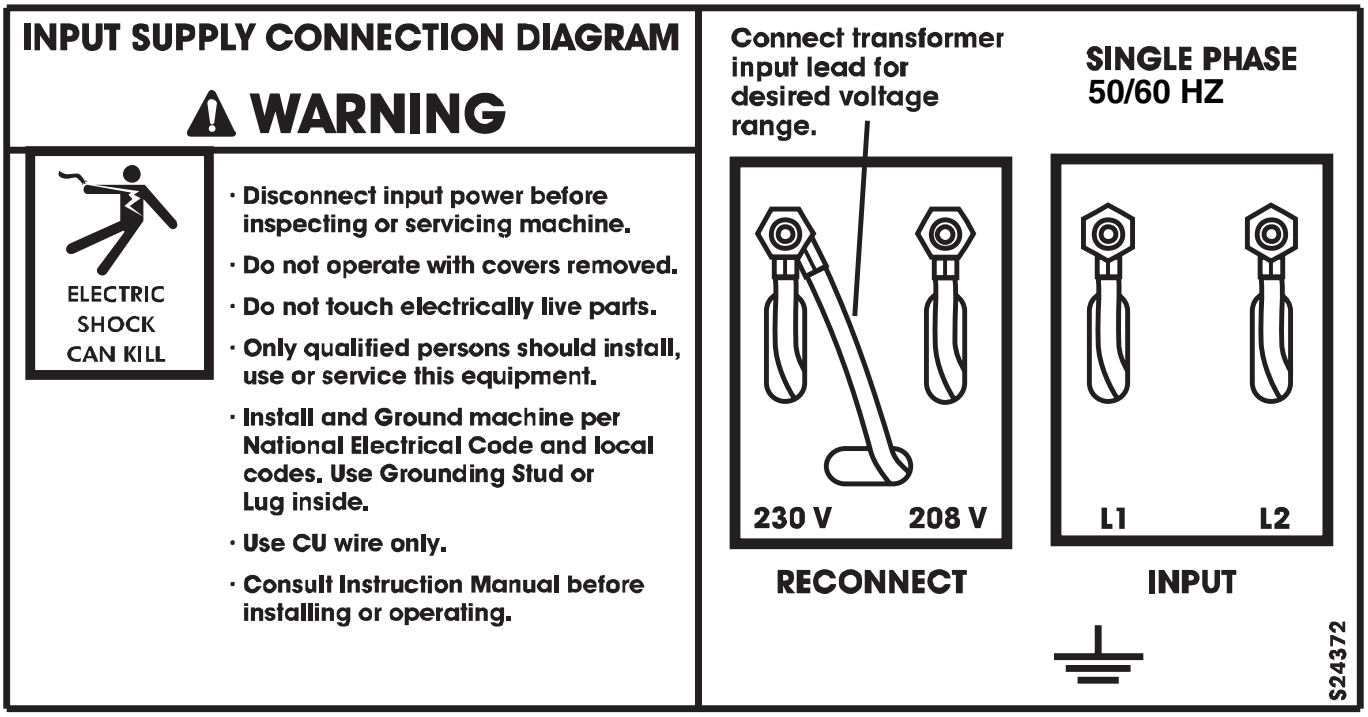
1. Before starting the installation, check with the local power company if there is any question about whether your power supply is adequate for the voltage, amperes, phase, and frequency specified on the welder nameplate. Also be sure the planned installation will meet the U.S. National Electrical Code and local code requirements. This welder may be operated from a single phase line or from one phase of a two or three phase line.

2. Models that have multiple input voltages specified on the nameplate (e.g. 208/230) are shipped connected for the highest voltage. If the welder is to be operated on lower voltage, it must be reconnected according to the instructions in Figure A.1 for dual voltage machines.

⚠ WARNING

Make certain that the input power is electrically disconnected before removing the screw on the reconnect panel access cover.

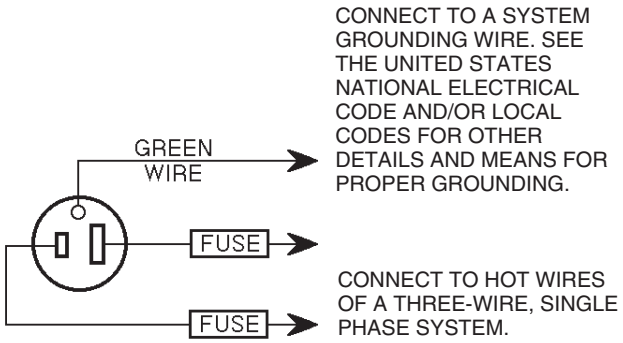
FIGURE A.1 — Dual Voltage Machine Input Connections


INPUT SUPPLY CONNECTION DIAGRAM
WARNING
ELECTRIC SHOCK CAN KILL
· Disconnect input power before inspecting or servicing machine.
· Do not operate with covers removed.
· Do not touch electrically live parts.
· Only qualified persons should install, use or service this equipment.
· Install and Ground machine per National Electrical Code and local codes. Use Grounding Stud or Lug inside.
· Use CU wire only.
· Consult Instruction Manual before installing or operating.
Connect transformer input lead for desired voltage range.
SINGLE PHASE 50/60 HZ
230 V
208 V
L1
L2
RECONNECT
INPUT
S24372

3. The 208/230 volt 50/60 Hz model POWER MIG is shipped with a 7 ft.(2.1m). input cable and plug connected to the welder.

4. Using the instructions in Figure A.2, have a qualified electrician connect a receptacle (Customer Supplied) or cable to the input power lines and the system ground per the U.S. National Electrical Code and any applicable local codes. See “Technical Specifications” at the beginning of this chapter for proper wire sizes. For long runs over 100 feet, larger copper wires should be used. Fuse the two hot lines with super lag type fuses as shown in the following diagram. The center contact in the receptacle is for the grounding connection. A green wire in the input cable connects this contact to the frame of the welder. This ensures proper grounding of the welder frame when the welder plug is inserted into a grounded receptacle.

FIGURE A.2 — Receptacle Diagram


CONNECT TO A SYSTEM GROUNDING WIRE. SEE THE UNITED STATES NATIONAL ELECTRICAL CODE AND/OR LOCAL CODES FOR OTHER DETAILS AND MEANS FOR PROPER GROUNDING.
GREEN WIRE
FUSE
FUSE
CONNECT TO HOT WIRES OF A THREE-WIRE, SINGLE PHASE SYSTEM.

OUTPUT POLARITY CONNECTIONS

The welder, as shipped from the factory, is connected for electrode positive (+) polarity. This is the normal polarity for GMA welding.

If negative (–) polarity is required, interchange the connection of the two cables located in the wire drive compartment near the front panel. The electrode cable, which is attached to the wire drive, is to be connected to the negative (–) labeled terminal and the work lead, which is attached to the work clamp, is to be connected to the positive (+) labeled terminal.

GUN AND CABLE INSTALLATION

The Magnum 250L gun and cable provided with the POWER MIG 215 is factory installed with a liner for .035-.045" (0.9-1.2 mm) electrode and an .035" (0.9 mm) contact tip. Be sure that the contact tip, liner, and drive rolls all match the size of the wire being used.

⚠ WARNING

Turn the welder power switch off before installing gun and cable.

1. Lay the cable out straight.
2. Unscrew knurled screw on the drive unit front end (inside wire feed compartment) until tip of screw no longer protrudes into gun opening as seen from front of machine.
3. Insert the male end of gun cable into the Gun Adapter casting through opening in front panel. Make sure connector is fully inserted and tighten knurled screw.
4. Connect the gun trigger connector from the gun and cable to the mating receptacle inside the compartment located above the gun connection made in item 3 above. Make sure that the keyways are aligned, insert and tighten retaining ring.

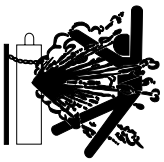
SHIELDING GAS

(For Gas Metal Arc Welding Processes)

Customer must provide cylinder of appropriate type shielding gas for the process being used.

A gas flow regulator, for Argon blend gas, and an inlet gas hose are factory provided with the POWER MIG 215. When using 100% CO_2 an additional adapter will be required to connect the regulator to the gas bottle.

⚠ WARNING



CYLINDER may explode if damaged.

- **Gas under pressure is explosive. Always keep gas cylinders in an upright position and always keep chained to undercarriage or stationary support. See American National Standard Z-49.1, "Safety in Welding and Cutting" published by the American Welding Society.**

Install shielding gas supply as follows:

1. Set gas cylinder on rear platform of POWER MIG 215. Hook chain in place to secure cylinder to rear of welder.
2. Remove the cylinder cap. Inspect the cylinder valves and regulator for damaged threads, dirt, dust, oil or grease. Remove dust and dirt with a clean cloth.

   DO NOT ATTACH THE REGULATOR IF OIL, GREASE OR DAMAGE IS PRESENT! Inform your gas supplier of this condition. Oil or grease in the presence of high pressure oxygen is explosive.
3. Stand to one side away from the outlet and open the cylinder valve for an instant. This blows away any dust or dirt which may have accumulated in the valve outlet.

⚠ WARNING

Be sure to keep your face away from the valve outlet when "cracking" the valve.

4. Attach the flow regulator to the cylinder valve and tighten the union nut(s) securely with a wrench.

   NOTE: If connecting to 100% CO_2 cylinder, an additional regulator adapter must be installed between the regulator and cylinder valve. If adapter is equipped with a plastic washer, be sure it is seated for connection to the CO_2 cylinder.
5. Attach one end of the inlet gas hose to the outlet fitting of the flow regulator, the other end to the POWER MIG 215 rear fitting, and tighten the union nuts securely with a wrench.
6. Before opening the cylinder valve, turn the regulator adjusting knob counterclockwise until the adjusting spring pressure is released.
7. Standing to one side, open the cylinder valve slowly a fraction of a turn. When the cylinder pressure gauge pointer stops moving, open the valve fully.

⚠ WARNING

Never stand directly in front of or behind the flow regulator when opening the cylinder valve. Always stand to one side.

8. The flow regulator is adjustable. Adjust it to the flow rate recommended for the procedure and process being used before making the weld.

AUXILIARY POWER RECEPTACLES

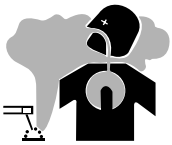
(15 Amp 120 Volt Receptacle) The receptacles are UL and CSA approved.

Read entire Operation section before operating the POWER MIG 215.

⚠ WARNING

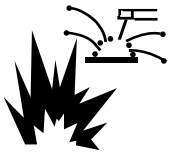
ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts or electrode with skin or wet clothing. Insulate yourself from work and ground.**
- **Always wear dry insulating gloves.**



FUMES AND GASES can be dangerous.

- **Keep your head out of fumes.**
- **Use ventilation or exhaust to remove fumes from breathing zone.**



WELDING SPARKS can cause fire or explosion.

- **Keep flammable material away.**
- **Do not weld on closed containers.**

ARC RAYS can burn eyes and skin.

- **Wear eye, ear and body protection.**

Observe all safety information throughout this manual.

PRODUCT DESCRIPTION

The POWER MIG™ 215 is a complete semiautomatic DC voltage arc welding machine built to meet NEMA specifications. It combines a tapped transformer voltage power source with a constant speed wire feeder to form a reliable robust performance welding system. A simple control scheme, consisting of continuous full range wire feed speed control, and 7 output voltage tap selections provides versatility with ease of use and accuracy.

Other features include a 2" (51 mm) O.D. wire reel spindle with adjustable brake, an integral gas cylinder mounting undercarriage, an adjustable Argon blend flow regulator with cylinder pressure gauge and inlet hose, a 15 ft. (3.6 m) Magnum 250L GMAW gun and cable with fixed (flush) nozzle, a 7 ft. (2.1 m) power cable with plug, and a 10 ft. (3.0 m) work cable with clamp.

Optional Spool Gun and Adapter kit, Dual Cylinder Mounting kit and Aluminum Feeding Kit for push feeding with standard built in feeder are also available.

RECOMMENDED PROCESSES AND EQUIPMENT

The POWER MIG 215 is recommended for GMA welding processes using 10 to 44 lb (4.5 to 20 kg) 2" (51 mm) I.D. spools or Readi-Reel® coils (with optional adapter) of .025" through .045" (0.6 – 1.2 mm) solid steel, .035" (0.9 mm) stainless, 3/64" (1.2 mm) aluminum and .035 (0.9 mm), .045" (1.2 mm) Outershield®; as well as .035" (0.9 mm) and .045" (1.2 mm) Innershield® self-shielding electrodes.

The POWER MIG is factory equipped to feed .035" (0.9 mm) electrodes. It also includes a 200A, 60% duty cycle (or 250A, 40% duty cycle) rated, 15 ft. (3.6 m) GMAW gun and cable assembly equipped for these wire sizes. Use of GMAW processes requires a supply of shielding gas.

WELDING CAPABILITY

The POWER MIG 215 is rated at 215 amps @ 22 volts, at a 30% duty cycle based on a ten minute cycle time. It is capable of higher duty cycles at lower output currents. The tapped transformer design makes it well suited for use with most portable or in-plant generating systems.

LIMITATIONS

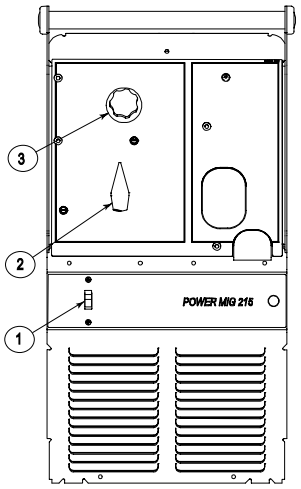
The output voltage/current of the POWER MIG 215 is subject to vary if the input power to the machine varies, due to its tapped transformer power topology. In some cases an adjustment of WFS preset and/or voltage tap selection may be required to accommodate a significant drift in input power.

DESCRIPTION OF CONTROLS

See Figure B.1

1. **Power ON/OFF Switch —** Place the lever in the "ON" position to energize the POWER MIG 215.
2. **Voltage Control —** Seven voltage tap selections are provided Labeled "A" (minimum voltage) through "G" (maximum voltage). It should only be adjusted when not welding. The control selection can be preset to the setting specified on the Procedure Decal on the inside of the wire compartment door.
3. **Wire Speed Control — T**his controls the wire feed speed from 50 – 700 inches per minute (1.2 – 17.8 m/min). Wire speed is not affected when changes are made in the voltage control.

FIGURE B.1



WIRE DRIVE ROLL

The drive rolls installed with the POWER MIG have two grooves one for .035(0.9mm) wire and the other for .045(1.2mm) wire. Drive roll size is indicated by the stenciling on the exposed side of the drive roll.

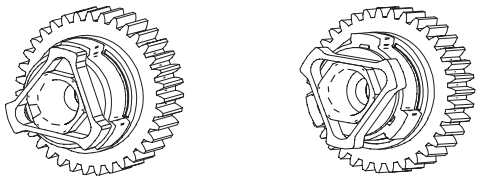
WIRE SIZE CONVERSION PARTS

The POWER MIG 215 is rated to feed .025 through .045" (0.6-1.2 mm) solid or cored electrode sizes.
The drive roll kits and Magnum 250L gun and cable parts are available to feed different sizes and types of electrodes. See Accessories section.

PROCEDURE FOR CHANGING DRIVE AND IDLE ROLL SETS

1. Turn off the power source.
2. Release the pressure on the idle roll by swinging the adjustable pressure arm down toward the back of the machine. Lift the cast idle roll assembly and allow it to sit in an upright position..
3. Remove the outside wire guide retaining plate by loosening the two large knurled screws.
4. Twist the drive roll retaining mechanism to the unlocked position as shown below and remove the drive rolls. (See FigureB.2)

FIGURE B.2



UNLOCKED POSITION LOCKED POSITION

5. Remove the inside wire guide plate.
6. Replace the drive rolls and inside wire guide with a set marked for the new wire size. **NOTE:** Be sure that the gun liner and contact tip are also sized to match the selected wire size.
7. Manually feed the wire from the wire reel, over the drive roll groove and through the wire guide and then into the brass bushing of the gun and cable assembly.
8. Replace the outside wire guide retaining plate by tightening the two large knurled screws. Reposition the adjustable pressure arm to its original position to apply pressure. Adjust pressure as necessary.

WIRE REEL LOADING - READI-REELS, SPOOLS OR COILS

To Mount a 30 Lb. (14 kg) Readi-Reel Package (Using the Molded Plastic K363-P Readi-Reel Adapter:)

1. Open the Wire Drive Compartment Door
2. Depress the Release Bar on the Retaining Collar and remove it from the spindle.
3. Place the Optional Adapter on the spindle
4. Re-install the Retaining Collar. Make sure that the Release Bar “pops up” and that the collar retainers fully engage the retaining ring groove on the spindle.
5. Rotate the spindle and adapter so the retaining spring is at the 12 o'clock position.
6. Position the Readi-Reel so that it will rotate in a direction when feeding so as to be de- reeled from top of the coil.
7. Set one of the Readi-Reel inside cage wires on the slot in the retaining spring tab.
8. Lower the Readi-Reel to depress the retaining spring and align the other inside cage wires with the grooves in the molded adapter.
9. Slide cage all the way onto the adapter until the retaining spring "pops up" fully.

⚠ CAUTION

CHECK TO BE SURE THE RETAINING SPRING HAS FULLY RETURNED TO THE LOCKING POSITION AND HAS SECURELY LOCKED THE READI-REEL CAGE IN PLACE. RETAINING SPRING MUST REST ON THE CAGE, NOT THE WELDING ELECTRODE.

10. To remove Readi-Reel from Adapter, depress retaining spring tab with thumb while pulling the Readi-Reel cage from the molded adapter with both hands. Do not remove adapter from spindle.

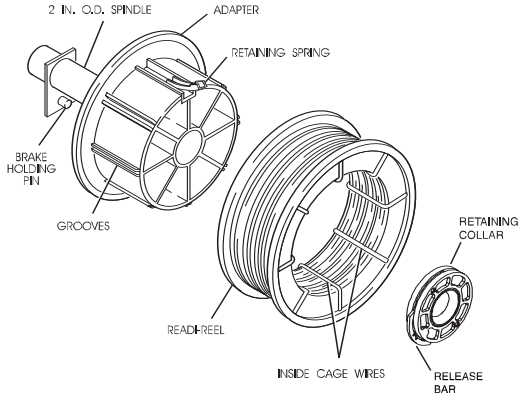


FIGURE B.1

To Mount 10 to 44 Lb. (4.5-20 kg) Spools (12"/300 mm Diameter) or 14Lb.(6 Kg) Innershield Coils:

(For 13-14 lb. (6 Kg) Innershield coils, a K435 Coil Adapter must be used).

1. Open the Wire Drive Compartment Door
2. Depress the Release Bar on the Retaining Collar and remove it from the spindle.
3. Place the spool on the spindle making certain the spindle brake pin enters one of the holes in the back side of the spool (Note: an arrow mark on the spindle lines up with the brake holding pin to assist in lining up a hole). Be certain the wire comes off the reel in a direction so as to de-reel from the top of the coil.
4. Re-install the Retaining Collar. Make sure that the Release Bar “pops up” and that the collar retainers fully engage the retaining ring groove on the spindle.

TO START THE WELDER

Turn the “Power Switch” switch to “ON”. With the desired voltage and wire speed selected, operate the gun trigger for welder output and to energize the wire feed motor.

FEEDING WIRE ELECTRODE

⚠ WARNING

When triggering, the electrode and drive mechanism are electrically "hot" relative to work and ground and remain "hot" several seconds after the gun trigger is released.

NOTE: Check that drive rolls, guide plates and gun parts are proper for the wire size and type being used. Refer to Table C.1 in Accessories section.

1. Turn the Readi-Reel or spool until the free end of the electrode is accessible.

2. While securely holding the electrode, cut off the bent end and straighten the first six inches. (If the electrode is not properly straightened, it may not feed properly through the wire drive system).

3. Release the pressure on the idle roll by swinging the adjustable pressure arm down toward the back of the machine. Lift the cast idle roll assembly and allow it to sit in an upright position. Leave the outer wire guide plate installed. Manually feed the wire through the incoming guide bushing and through the guide plates (over the drive roll groove). Push a sufficient wire length to assure that the wire has fed into the gun and cable assembly without restriction. Reposition the adjustable pressure arm to its original position to apply pressure to the wire.

4. Press gun trigger to feed the electrode wire through the gun.

IDLE ROLL PRESSURE SETTING

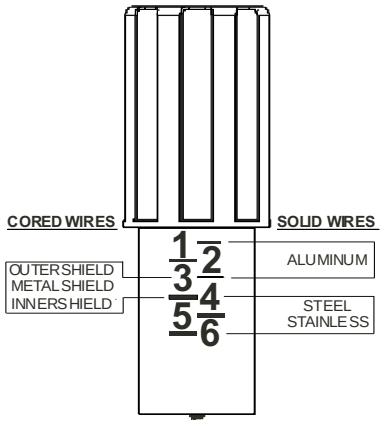
⚠ WARNING

ELECTRIC SHOCK can kill.
- **Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.**
- **Do not touch electrically live parts.**
- **When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.**
- **Only qualified personnel should perform maintenance work.**

The pressure arm controls the amount of force the drive rolls exert on the wire. Proper adjustment of both pressure arm gives the best welding performance. For best results, set both pressure arms to the same value.

Set the pressure arm as follows (See Figure B.2a):

Aluminum wires	between 1 and 3
Cored wires	between 3 and 4
Steel, Stainless wires	between 4 and 6



WIRE DRIVE CONFIGURATION

(See Figure B.2b)

Changing the Gun Receiver Bushing

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Turn the input power OFF at the welding power source before installation or changing drive rolls and/or guides.**
- **Do not touch electrically live parts.**
- **When inching with the gun trigger, electrode and drive mechanism are "hot" to work and ground and could remain energized several seconds after the gun trigger is released.**
- **Only qualified personnel should perform maintenance work.**

Tools required:
- 1/4" hex key wrench.

Note: Some gun bushings do not require the use of the thumb screw.

1. Turn power off at the welding power source.

2. Remove the welding wire from the wire drive.

3. Remove the thumb screw from the wire drive.

4. Remove the welding gun from the wire drive.

5. Loosen the socket head cap screw that holds the connector bar against the gun bushing.
   Important: Do not attempt to completely remove the socket head cap screw.

6. Remove the outer wire guide, and push the gun bushing out of the wire drive. Because of the precision fit, light tapping may be required to remove the gun bushing.

7. Disconnect the shielding gas hose from the gun bushing, if required.

8. Connect the shielding gas hose to the new gun bushing, if required.

9. Rotate the gun bushing until the thumb screw hole aligns with the thumb screw hole in the feed plate. Slide the gun receiver bushing into the wire drive and verify the thumb screw holes are aligned.

10. Tighten the socket head cap screw.

11. Insert the welding gun into the gun bushing and tighten the thumb screw.

MAKING A WELD

1. Check that the electrode polarity is correct for the process being used, then turn the power switch ON.

2. Set desired arc voltage tap and wire speed for the particular electrode wire, material type and thickness, and gas (for MIG and Outershield®) being used. Use the Application Chart on the door inside the wire compartment as a quick reference for some common welding procedures.

3. Press the trigger to feed the wire electrode through the gun and cable. For solid wire cut the electrode within approximately 3/8" (10 mm) of the end of the contact tip [3/4" (20 mm) for Outershield®].

4. When welding with gas, turn on the gas supply and set the required flow rate (typically 25-35 CFH; 12-16 liters/min).

5. Connect work cable to metal to be welded. Work clamp must make good electrical contact to the work. The work must also be grounded as stated in "Arc Welding Safety Precautions".

⚠ WARNING

- **When using an open arc process, it is necessary to use correct eye, head, and body protection.**

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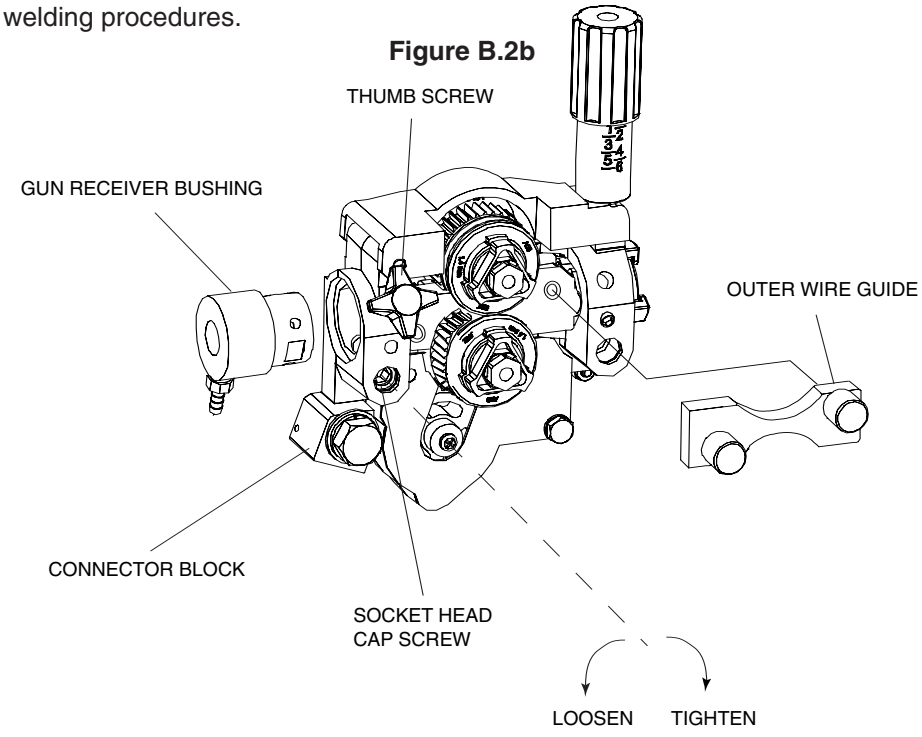
6. Position electrode over joint. End of electrode may be lightly touching the work.

7. Lower welding helmet, close gun trigger, and begin welding. Hold the gun so the contact tip to work distance is about 3/8" (10 mm) [3/4" (20 mm) for Outershield®].

8. To stop welding, release the gun trigger and then pull the gun away from the work after the arc goes out.

Figure B.2b



9. When no more welding is to be done, close valve on gas cylinder (if used), momentarily operate gun trigger to release gas pressure, and turn off POWER MIG 215.

NOTE: When using Innershield electrode, the gas nozzle may be removed from the insulation on the end of the gun and replaced with the gasless nozzle. This will give improved visibility and eliminate the possibility of the gas nozzle overheating.

AVOIDING WIRE FEEDING PROBLEMS

Wire feeding problems can be avoided by observing the following gun handling procedures:

1. Do not kink or pull cable around sharp corners.
2. Keep the gun cable as straight as possible when welding or loading electrode through cable.
3. Do not allow dolly wheels or trucks to run over cables.
4. Keep cable clean by following maintenance instructions.
5. Use only clean, rust-free electrode. The Lincoln electrodes have proper surface lubrication.
6. Replace contact tip when the arc starts to become unstable or the contact tip end is fused or deformed.
7. Keep wire reel spindle brake tension to minimum required to prevent excess reel over-travel which may cause wire “loop-offs” from coil.
8. Use proper drive rolls and wire drive idle roll pressure for wire size and type being used.

FAN CONTROL

The fan is designed to come on when input power is applied to the POWER MIG 215 and go off when power is removed.

INPUT LINE VOLTAGE VARIATIONS

High Line Voltage — Higher than rated input voltage will result in output voltages higher than normal for a given tap setting. If your input line is high, you may want to select a lower voltage tap than given on the recommended procedure chart.

Low Line Voltage — You may not be able to get maximum output from the machine if the line voltage is less than rated input. The unit will continue to weld, but the output may be less than normal for a given tap setting. If your input line is low, you may want to select a higher voltage tap than given on the recommended procedure chart.

WIRE FEED OVERLOAD PROTECTION

The POWER MIG has solid state overload protection of the wire drive motor. If the motor becomes overloaded, the protection circuitry turns off the wire feed speed and gas solenoid. Check for proper size tip, liner, and drive rolls, for any obstructions or bends in the gun cable, and any other factors that would impede the wire feeding. to resume welding, simply pull the trigger. There is no circuit breaker to reset, as the protection is done with reliable solid state electronics.

WELDING THERMAL OVERLOAD PROTECTION

The POWER MIG 215 has built-in protective thermostats that respond to excessive temperature. They open the wire feed and welder output circuits if the machine exceeds the maximum safe operating temperature because of a frequent overload, or high ambient temperature plus overload. The thermostats automatically reset when the temperature reaches a safe operating level and welding and feeding are allowed again, when gun is retriggered.

PROCEDURE CHART

				Wire Feed Speed/Voltage Tap Settings									
Wire Dia.	**Gas Type**	**Wire Type**	**Polarity**	**18 gage**	**16 gage**	**14 gage**	**12 gage**	**10gage**	**3/16**	**1/4**	**5/16**	**3/8**	**1/2**
Outershield	**1" CTWD†**												
.035	75Ar/25CO_2	OS71M	DC+				250/D	300/E	350/F	500/G	*500/G		
.035	100%CO_2	OS71M	DC+					300/E	350/F	500/G			
.045	75Ar/25CO_2	OS71M	DC+						200/E	225/F	250/G	250/G	*250/G
Innershield	**5/8" CTWD†**												
.035	NoneReq’d	NR-211MP	DC-	50/B	70/B	80/B	90/C	100/C					
.045	NoneReq’d	NR-211MP	DC-				50/B	70/C	90/C	110/D	**130/E		
.045	NoneReq’d	NR212	DC-	40/B	50/B	60/B	65/C	70/C	90/C	110/D	*130/E	*150/E	*150/E

† Contact Tip to Work Distance

* Note- Requires Multiple Pass

**.035 & .045 NR-211 MP are only recommended for a maximum steel thickness of 5/16"

DRIVE ROLL KITS

Refer to Table C.1 for various drive roll kits that are available for the POWER MIG 215.The item in **Bold** is supplied standard with the POWER MIG 215.

Wire	Size	Drive Roll Kit
Solid Steel	.023"-.030" (0.6-0.8 mm) .035" (0.9 mm) .045" (1.2 mm) **.035-.045 (0.9-1.2mm)** .040 (1.01)	KP1696-030S KP1696-035S KP1696-045S **KP1696-1** KP1696-2
Cored	.035" (0.9 mm) .045" (1.2 mm)	KP1697-035C KP1697-045C
Aluminum	3/64" (1.2 mm)	KP1695-3/64A

TABLE C.1

3/64" (1.2 mm) ALUMINUM FEEDING KIT (K1703-1)

This kit helps push feeding aluminum through standard machine feeder and gun. It provides gun and wire drive conversion parts to weld with 3/64" (1.2 mm) aluminum wire. 5356 alloy aluminum wire is recommended for best push feeding performance.

Kit includes drive rolls and wire guide plate for the wire drive, liner and two contact tips for the gun, along with installation instructions.

READI-REEL ADAPTER (K363P)

The K363P Readi-Reel Adapter mounts to the 2" spindle. It is needed to mount the 22-30 lb. Readi-Reels.

DUAL CYLINDER MOUNTING KIT (K1702-1)

Permits stable side-by-side mounting of two full size 228.6mm dia x 1.524m high(9" dia. x 5' high) gas cylinders with "no lift" loading. Simple installation and easy instructions provided. Includes upper and lower cylinder supports, wheel axles and mounting hardware.

SMALL SPOOL SPINDLE ADAPTER (K468)

The K468 spindle adapter allows the use of 8" diamter small spools.

ALTERNATIVE MAGNUM GMAW GUN AND CABLE ASSEMBLIES

The following Magnum 250L gun and cable assemblies are separately available for use with the POWER MIG 215. Each is rated 250 amps 40% duty cycle and is equipped with the integrated connector, twist-lock trigger connector, fixed nozzle and insulator, and includes a liner, diffuser, and contact tips for the wire sizes specified:

Length	Part No.	English Wire Size	Metric Wire Size
10' (3.0 m) 12' (3.6 m) 15' (4.5 m)	K533-1 K533-7 K533-3	.035 – .045"	0.9 – 1.2 mm

MAGNUM GUN CONNECTION KIT (Optional K466-6)

Using the optional K466-6 Magnum Connection kit for the POWER MIG permits use of standard Magnum 200, 300 or 400 gun and cable assemblies.

SPOOL GUN AND ADAPTER KIT (K1809-1)

The K1809-1includes the Magnum 250SG Spool gun and the adapter kit for connecting the spool gun to the Power MIG 215.

The Adapter Kit provides toggle switch selection between the machine's use with its feeder gun or the spool gun for same polarity welding with different wire and gas processes.

The kit includes a spool gun adapter module assembly with a single connecting plug and trigger switch, a rear gas inlet, fitting hose, solenoid valve assembly, and mounting hardware with installation and operation instructions.

⚠ WARNING

- **Unplug or Disconnect all input power from the POWER MIG 215 before installing the Spool Gun and Kit.**

MAKING A WELD WITH THE SPOOL GUN ADAPTER KIT AND SPOOL GUN INSTALLED

⚠ CAUTION

In either toggle switch position, closing either gun trigger will cause the electrode of both guns to be electrically "HOT". Be sure unused gun is positioned so electrode or tip will not contact metal case or other metal common to work.

---

1. Setting spool gun selector switch to the "Normal" position and pulling the trigger for the built-in feeder gun.

   - Disables spool gun operation and spool gun gas solenoid valve.
   - Closing feeder gun trigger starts feeder gun welding and makes both electrodes electrically "HOT".

2. Setting spool gun selector switch to the Spool Gun Position and pulling SPOOL GUN Trigger.

   - Disables built-in feeder gun operation and machine gas solenoid valve.
   - Enables spool gun operation and spool gun gas solenoid valve.
   - Closing spool gun trigger starts spool gun welding and makes both electrodes electrically "HOT".

3. Operation with POWER MIG 215:

   - Turn the POWER MIG-215 input power ON.
   - Adjusting the voltage tap control will increase or decrease your welding voltage.
   - Adjusting the wire speed control on the spool gun will increase or decrease the spool gun wire feed speed. NOTE: Adjusting the wire feed speed control on the Power Mig Panel has no affect on the spool gun's wire feed speed.

4. Refer to the procedure decal on the Power Mig for initial aluminum settings. Make a test weld to determine the final settings.

5. To return to normal POWER MIG 215 welding, release the spool gun trigger set spool gun selector switch to normal and reset feeder gun voltage procedure setting if necessary.

SAFETY PRECAUTIONS

⚠ WARNING

ELECTRIC SHOCK can kill.

- **Have an electrician install and service this equipment.**
- **Turn the input power off at the fuse box before working on equipment**
- **Do not touch electrically hot parts.**

GENERAL MAINTENANCE

In extremely dusty locations, dirt may clog the air passages causing the welder to run hot. Blow dirt out of the welder with low-pressure air at regular intervals to eliminate excessive dirt and dust build-up on internal parts.

The fan motors have sealed ball bearings which require no service.

DRIVE ROLLS AND GUIDE PLATES

After every coil of wire, inspect the wire drive mechanism. Clean it as necessary by blowing with low pressure compressed air. Do not use solvents for cleaning the idle roll because it may wash the lubricant out of the bearing. All drive rolls are stamped with the wire sizes they will feed. If a wire size other than that stamped on the roll is used, the drive roll must be changed.

For instructions on replacing or changing drive roll, see “Wire Drive Rolls” in Operation section.

CONTACT TIP AND GAS NOZZLE INSTALLATION

1. Choose the correct size contact tip for the electrode being used (wire size is stenciled on the side of the contact tip) and screw it snugly into the gas diffuser.

2. Screw the appropriate fixed gas nozzle fully onto the diffuser. Either the standard .50" (12.7 mm) flush nozzle or other optional flush or recessed (spray arc) nozzle sizes may be used. (See Table D.2 in this section.)

3. If using optional adjustable slip-on nozzles, see Table D.2 in this section.

- Be sure the nozzle insulator is fully screwed onto the gun tube and does not block the gas holes in the diffuser.

- Slip the appropriate gas nozzle onto the nozzle insulator. Either a standard .50" (12.7 mm) or optional .62" (15.9 mm) I.D. slip-on gas nozzle may be used and should be selected based on the welding application.

- Adjust the gas nozzle as appropriate for the GMAW process to be used. Typically, the contact tip end should be flush to .12" (3.2 mm) extended for the short-circuiting transfer process and .12" (3.2 mm) recessed for spray transfer.

GUN TUBES AND NOZZLES

1. Replace worn contact tips as required.

2. Remove spatter from inside of gas nozzle and from tip after each 10 minutes of arc time or as required.

GUN CABLE CLEANING

To help prevent feeding problems, clean cable liner after using approximately 300 pounds (136 kg) of electrode. Remove the cable from the wire feeder and lay it out straight on the floor. Remove the contact tip from the gun. Using an air hose and only partial pressure, gently blow out the cable liner from the gas diffuser end.

⚠ CAUTION

Excessive pressure at the beginning of the cleaning procedure may cause the dirt to form a plug.

Flex the cable over its entire length and again blow out the cable. Repeat this procedure until no further dirt comes out. If this has been done and feed problems are experienced, try liner replacement, and refer to trouble shooting section on rough wire feeding.

LINER REMOVAL AND REPLACEMENT

NOTE: Changing the liner for a **different** wire size requires replacement of the gas diffuser per Table D.1 to properly secure the different liner.

TABLE D.1

Diameter of Electrodes Used	Replacement Liner Part Number	Size Stencilled on End of Liner Bushing	Fixed Nozzle Gas Diffuser Part No. (and Stencil)	Adjustable Nozzle Gas Diffuser Part No. (and Stencil)
.025-.030" Steel (0.6-0.8 mm)	KP1934-2	.030 (0.8 mm)	KP2026-3	KP2026-2
.035-.045" Steel (0.9-1.2 mm)	KP1934-1	.045 (1.2 mm)	KP2026-3	KP2026-2
3/64" Aluminum (1.2 mm)	KP1955-1	3/64" (1.2 mm)	KP2026-3	KP2026-2

LINER REMOVAL, INSTALLATION AND TRIMMING INSTRUCTIONS FOR MAGNUM 250L

NOTE: The variation in cable lengths prevents the interchangeability of liners between guns. Once a liner has been cut for a particular gun, it should not be installed in another gun unless it can meet the liner cutoff length requirement. Liners are shipped with the jacket of the liner extended the proper amount.

1. Remove the gas nozzle and nozzle insulator, if used, to locate the set screw in the gas diffuser which is used to hold the old liner in place. Loosen the set screw with a 5/64" (2.0 mm) Allen wrench.

2. Remove the gas diffuser from the gun tube.

3. Lay the gun and cable out straight on a flat surface. Loosen the set screw located in the brass connector at the feeder end of the cable and pull the liner out of the cable.

4. Insert a new untrimmed liner into the connector end of the cable. Be sure the liner bushing is stencilled appropriately for the wire size bing used.

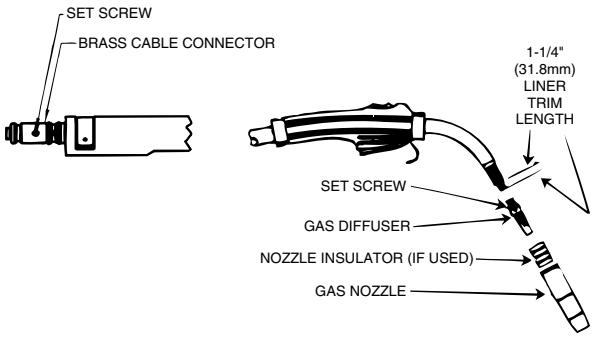
5. Fully seat the liner bushing into the connector. tighten the set screw on the brass cable connector. the gas diffuser, at this time, should **not** be installed onto the end of the gun tube.

6. With the gas diffuser still removed from the gun tube, be sure the cable is straight, and then trim the liner to the length shown in Figure D.1. Remove any burrs from the end of the liner.

7. Screw the gas diffuser onto the end of the gun tube and securely tighten. Be sure the gas diffuser is correct for the liner being used. (See table and diffuser stencil.)

8. Tighten the set screw in the side of the gas diffuser against the cable liner using a 5/64" (2.0 mm) Allen wrench.

FIGURE D.1



⚠ CAUTION

This screw should only be gently tightened. Overtightening will split or collapse the liner and cause poor wire feeding.

GUN HANDLE DISASSEMBLY

The internal parts of the gun handle may be inspected or serviced if necessary.

The gun handle consists of two halves that are held together with a collar on each end. To open up the handle, turn the collars approximately 60 degrees counterclockwise (the same direction as removing a right hand thread) until the collar reaches a stop. Then pull the collar off the gun handle. If the collars are difficult to turn, position the gun handle against a corner, place a screwdriver against the tab on the collar and give the screwdriver a sharp blow to turn the collar past an internal locking rib.

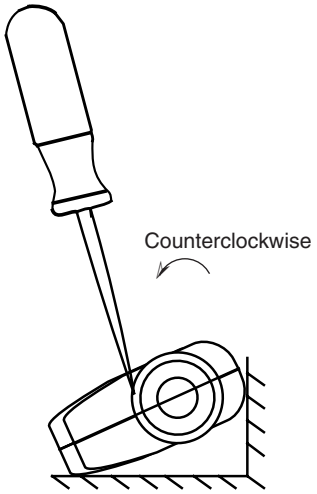


TABLE D.2
ACCESSORIES AND EXPENDABLE REPLACEMENT PARTS FOR MAGNUM 250L GUN AND CABLE ASSEMBLIES

Description	Part No.	English Size	Metric Size
CABLE LINER			
For 15' (4.5 m) or shorter Cable	KP1934-2	.025 – .030"	0.6 – 0.8 mm
	KP1934-1	.035 – .045"	0.9 – 1.2 mm
	KP1955-1	3/64" (Alum. wire)	1.2 mm (Alum. wire)
CONTACT TIPS			
Standard Duty	KP2020-6B1	.025"	0.6 mm
	KP2020-7B1	.030"	0.8 mm
	KP2020-1B1*	.035"	0.9 mm
	KP2020-2B1	.045"	1.2 mm
Heavy Duty	KP2021-1B1	.035"	0.9 mm
	KP2020-2B1	.045"	1.2 mm
Tapered	KP2022-5B1	.025"	0.6 mm
	KP2022-6B1	.030"	0.8 mm
	KP2022-1B1	.035"	0.9 mm
	KP2022-2B1	.045"	1.2 mm
Tab (For Aluminum)	KP2010-5B1	3/64" (Alum. Wire)	1.2 mm (Alum. Wire)
GAS NOZZLES			
Fixed (Flush)	KP1931-1	3/8"	9.5 mm
	KP1931-2 *	1/2"	12.7 mm
	KP1931-3	5/8"	15.9 mm
(Recessed)	KP1930-1	3/8"	9.5 mm
	KP1930-2	1/2"	12.7 mm
	KP1930-3	5/8"	15.9 mm
Requires: Gas Diffuser As'bly	KP2026-3 *	.025 – .045"	0.6 – 1.2 mm
Adjustable Slip-On	KP1935-2	1/2"	12.7 mm
	KP1935-1	5/8"	15.9 mm
Requires: Nozzle Insulator As'bly	KP2025-1		
Requires: Gas Diffuser As'bly	KP2026-2	.025 – .030"	0.6 – 0.8 mm
	KP2026-1	.035 – .045"	0.9 – 1.2 mm
Gasless Nozzle (For Innershield)	KP1947-1 Δ		
GUN TUBE ASSEMBLIES			
Standard (60°)	KP2015-1 *		
45°	KP2041-1		

* Included with POWER MIG 215
Δ Requires KP2026-1 Gas Diffuser Assembly.

HOW TO USE TROUBLESHOOTING GUIDE

⚠ WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).
Look under the column labeled "PROBLEM (SYMPTOMS)". This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.
The second column labeled "POSSIBLE CAUSE" lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION
This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

TROUBLESHOOTING

E-2

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
Major Physical or Electrical Damage is Evident	1. Contact your Local Lincoln Authorized Field Service Facility.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**
There is no wire feed or open circuit voltage when the gun trigger is pulled. Input power is applied to POWER MIG 215.	1 The gun trigger or cable may be faulty. Check or replace gun assembly. 2. The thermal protection circuit may be activated. If this is the case allowing the machine to cool will clear the error condition. 3. Make sure input voltage is correct and matches nameplate rating and reconnect panel configuration. 4. If spool gun option kit is in stalled, check to see that it is set to “Normal” if pulling the gun trigger associated with built in feeder, and “Spool Gun” if pulling spool gun trigger.	
Output voltage and wire feed is present when gun trigger is not pulled (not activated).	1. Remove gun assembly from machine. If problem is solved gun assembly is faulty. Repair or replace. 2. If problem persists when gun assembly is removed from machine then the problem is within the POWER MIG 215.	
Machine output is low. Welds are “cold”, weld bead is rounded or bumped up demonstrating poor wetting into plate.	1. Check input voltage. Make sure input voltage matches nameplate rating and reconnect panel configuration. 2. Make sure settings for wire feed speed and voltage are correct for process being used. 3. Make sure output polarity is correct for process being used. 4. Check welding cables and gun assembly for loose or faulty connections.	

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **LOCAL AUTHORIZED LINCOLN ELECTRIC FIELD SERVICE FACILITY** for assistance before you proceed.

TROUBLESHOOTING

E-3

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
OUTPUT PROBLEMS		
Poor arc striking with electrode sticking or blasting off.	1. Make sure settings for wire feed speed and voltage are correct for process being used. 2. The gas shielding may be improper for process being used. 3. Check input line voltage to be with in machines recommended rating range. 4. Check that the machine reconnect panel is configured properly for the applied voltage.	
Auxiliary receptacle is “dead” - no auxiliary voltage.	1. Circuit breaker (on case back) may have opened. Reset.	
FEEDING PROBLEMS		
Rough wire feeding or wire will not feed but drive rolls are turning.	1. The gun cable may be kinked or twisted. 2. The wire may be jammed in the gun cable, or gun cable may be dirty. 3. Check drive roll tension and position of grooves. 4. Check for worn or loose drive rolls. 5. The electrode may be rusty or dirty. 6. Check for damaged or incorrect contact tip. 7. Check wire spindle for ease of rotation and adjust break tension knob if necessary. 8. Check that the gun is pushed all the way into gun mount and properly seated.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **LOCAL AUTHORIZED LINCOLN ELECTRIC FIELD SERVICE FACILITY** for assistance before you proceed.

TROUBLESHOOTING

E-4

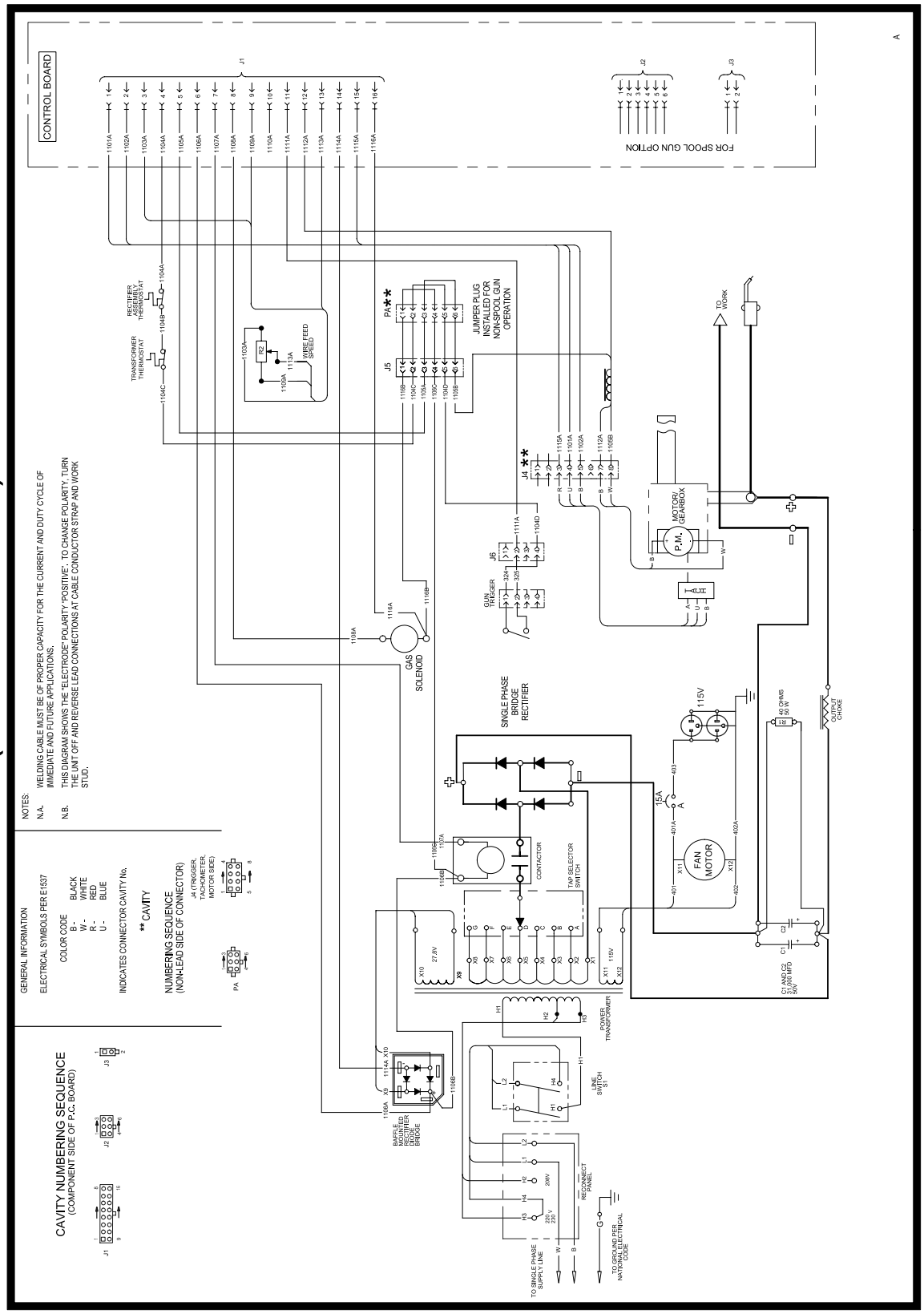
Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE CAUSE	RECOMMENDED COURSE OF ACTION
FEEDING PROBLEMS		
The wire feed stops while welding. When trigger is released and pulled again the wire feed starts.	1. Check the wire feed drive rolls and motor for smooth operation. 2. Check for restrictions in the wire feed path. Check the gun and cable for restrictions. 3. Make sure gun liner and tip are correct for wire size being used. 4. Make sure drive rolls and guide plates are clean and are the correct size. 5. Check spindle for ease of rotation.	
No control of wire feed speed. Other machine functions are normal.	1. The wire feed speed control may be dirty. Rotate several times and check if problem is resolved.	
GAS FLOW PROBLEMS		
Gas does not flow when gun trigger is pulled.	1. Make sure gas supply is connected properly and turned “on”. 2. If the gas solenoid does actuate (click) when the gun trigger is pulled there may be a restriction in the gas supply line. 3. The gun cable assembly may be faulty. Check or replace. 4. If gas solenoid does not operate when gun trigger is pulled the problem is within the POWER MIG 215. 5. Make sure the gun is pushed all the way into gun mount and is properly seated.	If all recommended possible areas of misadjustment have been checked and the problem persists, **Contact your local Lincoln Authorized Field Service Facility.**

⚠ CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **LOCAL AUTHORIZED LINCOLN ELECTRIC FIELD SERVICE FACILITY** for assistance before you proceed.

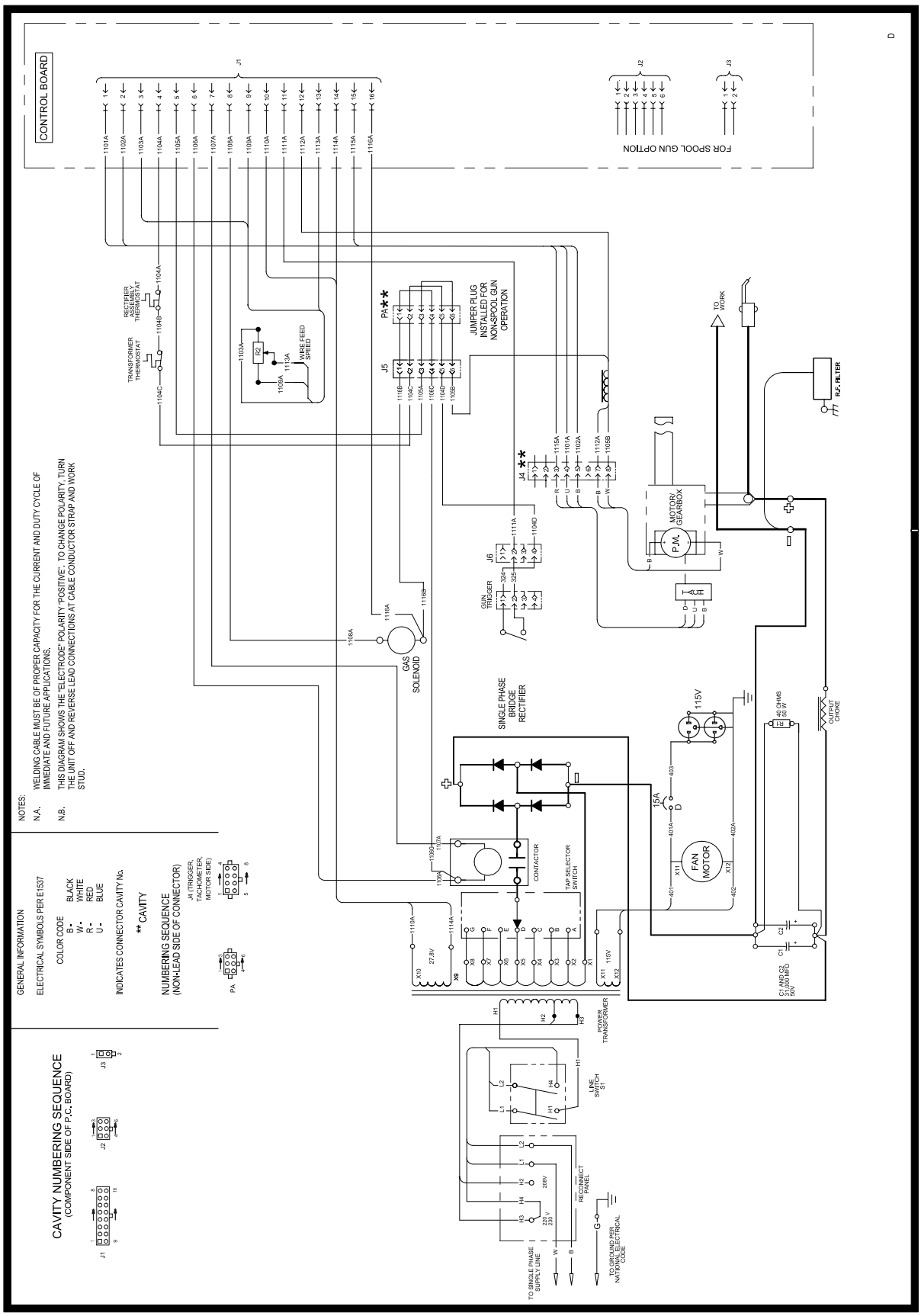
POWER MIG 215 (208/220/230V) CODE 11070



L11986

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

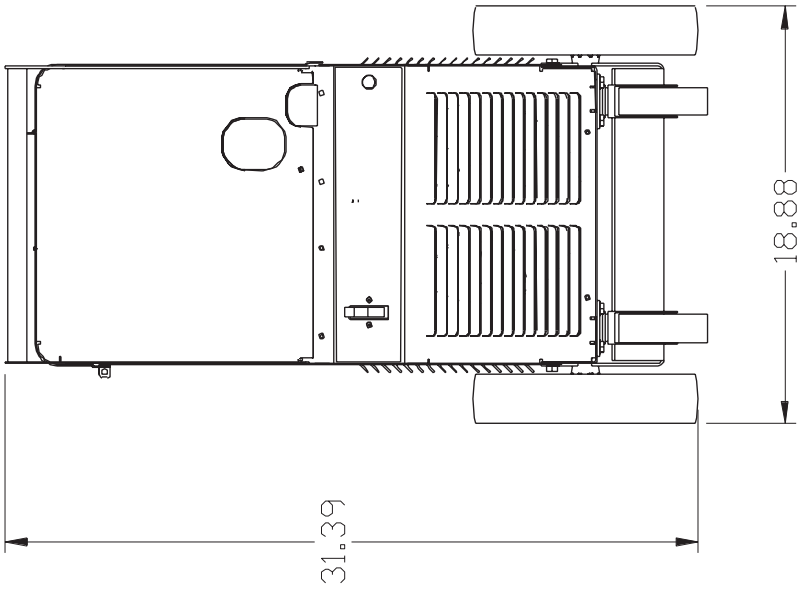
POWER MIG 215 (208/220/230V) FOR CODES 11099 AND ABOVE



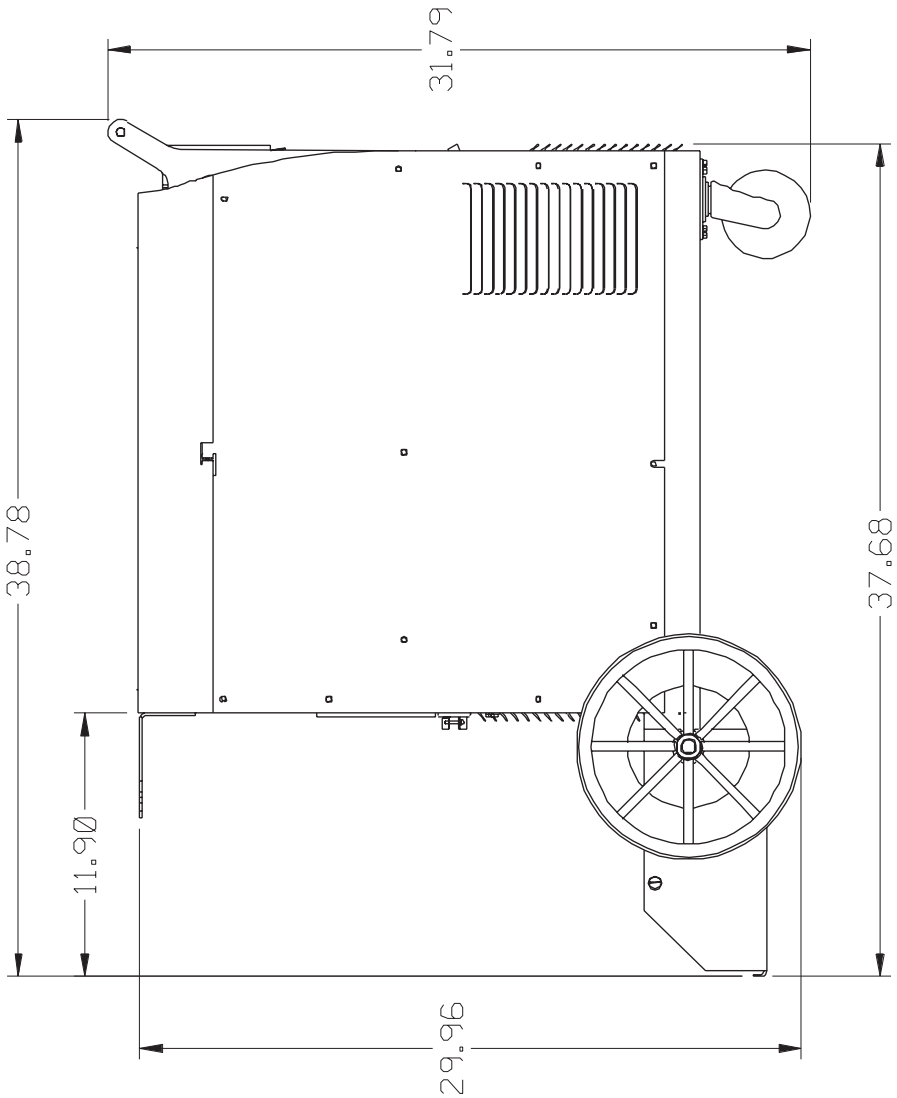
L12184

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

DIMENSION PRINT

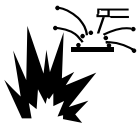


3-00F M19231



NOTES

NOTES

			
WARNING	● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground.	● Keep flammable materials away.	● Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aislese del trabajo y de la tierra.	● Mantenga el material combustible fuera del área de trabajo.	● Protéjase los ojos, los oídos y el cuerpo.
French **ATTENTION**	● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre.	● Gardez à l'écart de tout matériel inflammable.	● Protégez vos yeux, vos oreilles et votre corps.
German **WARNUNG**	● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden!	● Entfernen Sie brennbarres Material!	● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**	● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra.	● Mantenha inflamáveis bem guardados.	● Use proteção para a vista, ouvido e corpo.
Japanese **注意事項**	● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。	● 燃えやすいものの側での溶接作業は絶対にしてはなりません。	● 目、耳及び身体に保護具をして下さい。
Chinese **警 告**	● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絕緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von Schweibrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese **注意事項**
●頭部遠離煙霧。 ●在呼吸區使用通風或排風器除煙。	●維修前切斷電源。	●儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的説明以及應該使用的銀捍材料，並請遵守貴方的有関勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

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